WHAT IS CLAIMED IS:

1. A wind power generation system, comprising:

a frame;

an impeller rotatably supported by the frame;

plural field magnets aligned at equal intervals from the center of rotation in either the frame or the impeller; and

plural coils aligned circularly in the other,

wherein a relative motion of the field magnets and the coils within close distance generates an electric power under the reverse action of a linear motor.

2. A wind power generation system according to claim 1,

wherein the field magnets are aligned circularly around the vicinity of the periphery or medium portion of the impeller; a ring-shaped member is provided in proximity to the field magnet in the frame; and the coils are mounted on the ring-shaped member.

3. A wind power generation system according to claim 2,

wherein the ring-shaped member on which the coils are mounted is provided in one pair to place the field magnet in between and is provided circularly on the impeller; the coils mounted on the one side of the ring-shaped member and the coils mounted on the other side of the ring-shaped member are divided into plural groups aligned alternatively or cyclically respectively for generating alternative currents; the coils mounted on the one side having a specific phase and the coils mounted on the other side having a corresponding phase with the specific phase are circumferentially staggered in the alignment and the coils mounted on the one side and the coils mounted on the other side having a corresponding phase with the specific phase are connected in series.

4. A wind power generation system according to claim 3,

wherein the coils mounted on the one side and the coils mounted on the other side are divided respectively into a first coil group, a second coil

group and a third coil group which are cyclically aligned so as to generate three phase alternative currents; the first coil group of the coils mounted on the one side are staggered so as to face the second coil group of the coils mounted on the other side or the third coil group of the coils mounted on the other side.

5. A wind power generation system according to claim 2, wherein the ring-shaped member has plural ring pieces of a given length connected into one shaped body; and each ring piece comprises a core composed of superposed plural metal plates, the coils composed of a conducting wire wounded around its periphery, and a synthetic resin solidifying the core and the coils into one body.

6. A wind power generation system according to claim 1, wherein an annular supporting means is intervened between the periphery or the medium part of the impeller the frame, for supporting at least a part of the weight of the impeller allowing rotation of the impeller.

7. A wind power generation system according to claim 3, wherein the supporting means comprises a rolling body group or a sliding body group provided either on the frame or the impeller and a runway which contacts the rolling body group or the sliding body group provided on the other.

8. A wind power generation system according to claim 3, wherein the above supporting means comprises a first magnet group provided on the frame and a second magnet group provided on the impeller so as to repel against the first magnet group.

9. A wind power generation system according to claim 8, wherein the first magnet group is aligned in substantially continuous circularity to the frame; the impeller has plural blades aligned radially; the second magnet group is aligned radially to support the impellers.

10. A wind power generation system according to claim 1, wherein a space-adjusting means is provided for adjusting the gap.

11. A wind power generation system according to claim 1, wherein the system is so composed that in a condition of temporal weak wind power, a current is applied to a part or all of the coils to induce the linear motor action in the field magnets and the coils, thereby a rotation torque is given to the impeller.

12. A wind power generation system according to claim 6, wherein the supporting means comprises an annular guide whose center is disposed at the rotation center of either the frame or the impeller and a slider provided on the other and running along the guide.

13. A wind power generation system, comprising:

a frame;

an impeller supported rotatably by the frame; and

an electric power generator generating electric powers by the rotation of the impeller, wherein an annular guide whose center is disposed at the rotation center is provided either on the frame or the impeller and a slider running along the guide is provided on the other.

14. A wind power generation system according to claim 12 or 13, wherein the guide and the slider are those of a linear slide ball bearing.

15. A wind power generation system according to claim 12, wherein the annular guide has smooth guiding surfaces at its both sides and the slider has a guide roller rolling along the guide surfaces and rotating around the vertical shaft.

16. A wind power generation system according to claim 1 or 9, wherein the rotation center of the impeller is set in a horizontal direction.

17. An electric power-mechanical force converter, comprising:

a moving part; and

a stator located at both or one side of the moving part,

wherein magnet parts composed of a pair of N pole and S pole on the both sides of the moving parts are so disposed as to have alternative positions

of the N pole and the S pole; the S pole and the N pole, along the circumference of the moving part.

18. An electric power-mechanical force converter according to claim 17, wherein the adjacent magnet parts are coupled by nonmagnetic material.

19. An alignment of permanent magnets in which one surface of the permanent magnets is paralleled in the same pole face and magnetic bodies whose length is shorter than the thickness of the permanent magnet are intervened between the both permanent magnets.

20. An electric power-mechanical force converter having stators on the both sides of the magnetic pole of the moving part, wherein the stator coils wound around the both stators are crossed each other between the same phases.

21. An electric power-mechanical force converter according to claim 20, wherein the phase of the one stator coil is set to be the order of u-z-v-x-w-y; the phase of the other stator coil is set to be the order of x-w-y-u-z-v; they are aligned so as to face in a opposed position; and the stator coils of the both sides are crossed each other between the same phase.

22. A wind power generation system, comprising:

plural blades;

an annular supporting member to support the blades aligned circularly;

a guide member to support the supporting member being faced to the supporting member;

a field magnet provided on either the supporting member or the guide member; and

a coil provided on the other to generate electric power by moving relatively to the field magnet, having no shaft at the center of the blades.

23. An electric power-mechanical force converter, comprising:

a moving part;

stators disposed on both sides of the moving part;

a repelling magnet of the moving part side disposed so as to move together with the moving part; and

a repelling magnet of the stator side repelling the repelling magnet of the moving part side,

wherein either the repelling magnet of the moving part side or the repelling magnet of the stator side is disposed so as to intervene the other to push the moving part to a neutral position.

24. An electric power-mechanical force converter according to claim 23,

wherein the repelling magnet of the stator side is disposed in one pair so as to intervene the repelling magnet of the moving part side.

25. An electric power-mechanical force converter according to claim 23,

wherein the repelling magnet of the moving part side is disposed in one pair so as to intervene the repelling magnet of the stator side.

26. A wind power generation system according to claim 10,

wherein the gap-adjusting means automatically keeps the gap between the field magnet and the coils within a given range when the dimension of the flame or the impeller changes according to the ambient temperature change.

27. A wind power generation system according to claim 10,

wherein the gap-adjusting means automatically adjusts the gap between the field magnet and the coils widening the gap when in weak winds and narrowing the gap when in strong winds.

28. A wind power generation system according to claim 1,

wherein at least some of the groups of coils in the coils are wired in series/parallel in a switchable way, generating low voltages in the parallel wiring in weak winds and generating high voltages in the series wiring in strong winds.

29. A power generator, comprising:

a vertical airflow path with its upper part and lower part being communicated with ambient air;

an impeller rotated by an ascending airflow provided in the airflow path;

a power generator working with the rotating part of the impeller.

30. A power generator according to claim 29,

wherein the impeller rotates around the rotation shaft extending in a vertical direction.

31. A power generator according to claim 29,

wherein the airflow path is so composed as to be integrated with a building.

32. A power generator according to claim 29,

wherein the airflow path is composed of walls having a cylindrical shape provided with openable and closable windows.

33. A power generator according to claim 29,

wherein a heat absorbing part whose temperature rises by receiving solar heat is provided inside or outside of the airflow path.

34. A power generator according to claim 31,

wherein the airflow path serves for a path for waste heat of the building.

35. A power generator according to claim 29,

wherein plural pipes composing the airflow path are aligned circularly and a power generator for side winds supported by the pipes is further provided.

36. A power generator according to claim 29,

wherein plural pipes composing the airflow path are aligned circularly; the heat absorbing part whose temperature rises by receiving solar heat is provided under the pipe column; and the heat absorbing part and the lower part of the pipes are communicated.

37. A heat exchange system, comprising:

a first heat exchanger located near the ground;

a second heat exchanger located at the position where the temperature is different from that of the ground;

a piping to couple the first heat exchanger and the second heat exchanger making a loop; and

a means to circulate the heat medium flowing in the pipes.

38. A heat exchange system according to claim 37,

wherein the power to drive the means to circulate the heat medium is supplied by wind powers.

39. A wind power generation system according to claim 1,

wherein the impeller comprises one pair of a ring, blades supported by the ring, a spoke-like supporting member provided on the ring, a boss provided at the center of the supporting member.

40. An electric power-mechanical force converter according to claim 17,

wherein the moving part is composed of a thin rotating plate provided with the field magnet.

41. An electric power-mechanical force converter according to claim 40,

wherein a reinforcing wall perpendicular to the rotating plate is provided on the edge of the rotating plate.